NISTIR 6890

Fire Resistance Determination and Performance Prediction Research Needs Workshop: Proceedings

William Grosshandler Editor



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William Grosshandler Editor Building and Fire Research Laboratory

September 2002

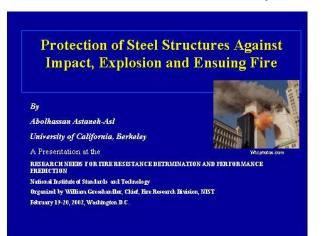


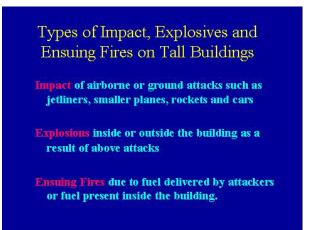
U.S. Department of Commerce Donald L. Evans, Secretary

Technology Administration *Phillip J. Bond, Under Secretary of Commerce for Technology*

National Institute of Standards and Technology Arden L. Bement, Jr., Director

M. Protection of Steel Structures Against Blast, Impact and Ensuing Fires Abolhassan Astaneh, Department of Civil and Environmental Engineering University of California, Berkeley CA





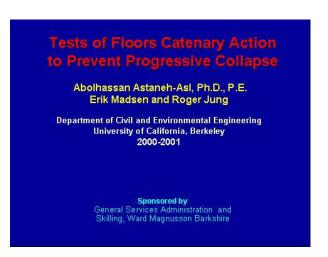
Effects of Impact on the Buildings

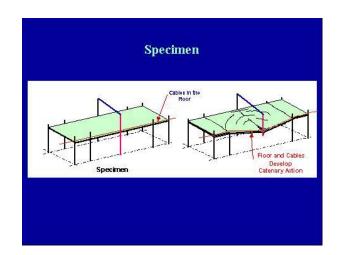
- Applies concentrated dynamic force to the building.
- Depending on dynamic interaction of the building with impacting object, dynamic forces will be generated throughout the building and its structure.
- Such dynamic forces can cause serious damage at local and global level to structural, non-structural and fire protection system.



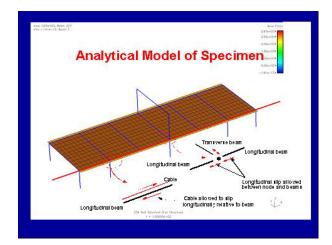
Effects of Impact and Ensuing Fire on the Structure

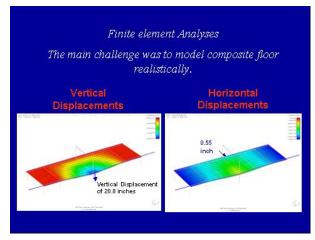
- 1. Local and Global Damage to Structure
- 2. Initial Damage to Fire Protection Systems
- Progressive Collapse Due to Deterioration in Strength or Stability of Gravity Load Carrying System Caused by Ensuing Fire.











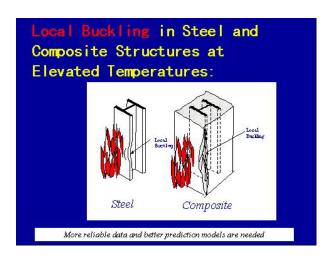
Challenges and Research Needs in Realistic Modeling of Behavior of Steel and Composite Structures Under Intense and Sustained Fires

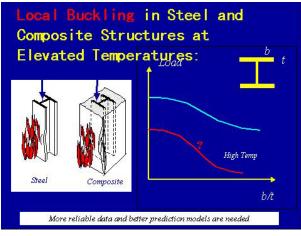
Research Data on Fire-Resistance of Light Weight and High Strength Concrete is Needed

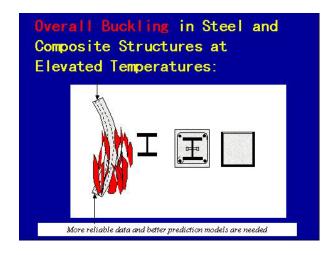
Research Needs

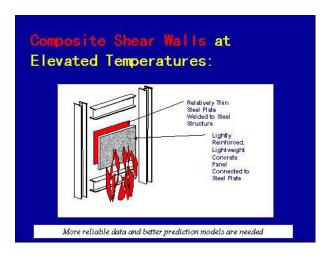
Steel Structures: Connections Research Funded by NSF

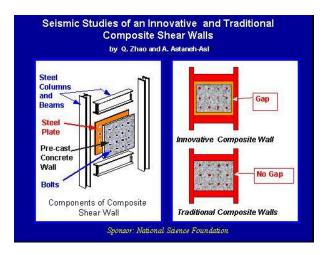
Steel Structures: Research data and more realistic models of: 1. Local Buckling 2. Overall Buckling and 3. Connections can be very useful.

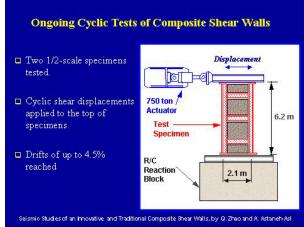








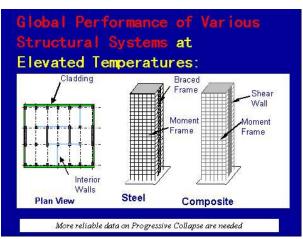












Some Research Needs on Steel and Composite Structures Subjected to High Temperature

- Light Weight Concrete
- Local Buckling
- Overall Buckling
- ❖ Performance of Various Systems